

CLAIMS:

1. A laser device for causing lasing by using a semiconductor quantum dot, comprising
  - a laser member in which said semiconductor quantum dot is formed;
  - a resonating section for resonating light generated in the laser member; and
  - an excitation light source section for irradiating the laser member with excitation light whose energy corresponds to two-photon resonant excitation, so as to form a biexciton state in the semiconductor quantum dot by the two-photon resonant excitation.
2. The laser device as set forth in claim 1, wherein a continuous irradiation period in which said excitation light source section continuously irradiates the laser member with excitation light is of the order of picoseconds.
3. The laser device as set forth in claim 1, wherein a continuous irradiation period in which said excitation light source section continuously irradiates the laser member with excitation light is of the order of femtoseconds.
4. The laser device as set forth in any one of claims 1 to 3, wherein
  - said laser member includes the semiconductor quantum dot and a base material retaining the semiconductor quantum dot;
  - said semiconductor quantum dot is made of any one of CuCl,

CuBr, CdSe, CdS; and

    said base material is made of glass or alkali halide crystal.

5. The laser device as set forth in any one of claims 1 to 3, wherein

    said laser member includes the semiconductor quantum dot and a base material retaining the semiconductor quantum dot;

    said semiconductor quantum dot is made of InAs or InGaSb; and

    said base material is made of GaAs.

6. A lasing method which causes lasing by using a semiconductor quantum dot, comprising the step of:

    forming a biexciton state in the semiconductor quantum dot by two-photon resonant excitation, so as to cause lasing by inducing light emission from the semiconductor quantum dot.

7. The lasing method as set forth in claim 6, wherein

    said biexciton state in the semiconductor quantum dot is formed by irradiating the semiconductor quantum dot with excitation light whose energy corresponds to said two-photon resonant excitation.

8. The lasing method as set forth in claim 7, wherein  
    a continuous irradiation period of said excitation light is of the order of picoseconds.

9. The lasing method as set forth in claim 7, wherein  
    a continuous irradiation period of said excitation

light is of the order of femtoseconds.